

New “Teaching” Idea: Sharing Mistakes

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Abstract: Learning from mistakes is one way of basic learning. Currently both primary and secondary schools, even colleges and universities, have focused on their teaching practice that students learn from their own mistakes, not from teachers'. This paper proposes that teachers share their own rational mistakes with their students in the process of teaching practice, then studies Confucius' educational thinking which also contains the new idea, sharing mistakes. To practise the new idea, specific suggestions have been proposed, and difficulties in theory and practice will be faced.

Key words: teaching idea; sharing mistake; teaching suggestion

As we know, Learning from mistakes is one way of basic learning for Man. In the book, *Conjectures and Refutations*, Karl Popper said that all the chapters could conclude one sentence that we can learn from our past mistakes.

In the recent years, many teaching studies are based on students' reaction to mistakes to reflect different cultures (Broadfoot, 1992;^① Firestone, Fitz, & Broadfoot, 1999; Osborn & Broadfoot, 1992; Stevenson & Stigler, 1992). Among other cultural differences, the authors describe distinctively different approaches to students' mistakes: English teachers made more effort to protect students' self-esteem and avoid negative feedback; French teachers were observed responding directly to students' wrong answers and sometimes shouting at students' (Osborn & Planel, 1999).^② For Japanese teachers, they regard mistakes as having a positive function (Stevenson & Stigler, 1992; Stigler & Hiebert, 1999). Students in Japanese mathematics lesson are called to the front of the classroom to share their own problem solutions with their classmates. These wrong solutions are sources of useful discussions. Japanese teachers also plan their lessons taking into account mistakes most frequently made by their students, which is similar to the Chinese classroom.

One: Can students have an opportunity to learn from teachers' mistakes?

All the studies above are focused on mistakes made by students. Few studies, such as a mistake game conducted by Doctor Daniel R Stalder,^③ showed the teaching value of teachers' mistakes. The object of Daniel's mistake game from the students' perspective is to catch as many of the teacher's mistakes (during lectures) as they can, before the teacher catches and corrects them. And the technical object of the game from the teacher's perspective is not to make many mistakes. One potential benefit to the game is that it usually generates some laughs and some fun. This brings the teacher a little closer to the students' level (from the students' perspective), lowering the teacher's perceived competence and authority. I think that Doctor Daniel's behavior showed a true teacher's character, but I still don't feel satisfied because he haven't directly analyzed his own

^①Broadfoot, P.(1992). Assessment developments in French education. *Educational Review*, 44(3), 309-326.

^②Rossella Santagata, Practices and beliefs in mistake-handling activities: A video study of Italian and Us mathematics lessons, teaching and teacher education, 21(2005), p491-508.

^③Daniel R Stalder Primus: Problems, Resources, and Issues in Mathematics Undergraduate Studies. West Point: Sep 2001. Vol. 11, Iss. 3; pg. 281, 5pgs.

mistakes which students will never know if teachers don't tell them to his students. The latter situation may be more difficult for teachers, and more important for students because they can learn from mistakes which are concerned with subject not because the teacher might miscopy a number from one line to the next.

In china, most of teaching studies, including new curriculum reform all over many provinces in china during the past five years (from 2001 to 2005, further curriculum reform still continues), have been performed under the background that most of teachers have no inclination to sharing their own mistakes with their students. We may talk about democracy and obligations, but it's very regretful, because no research has shown the relationship between democracy and sharing mistakes, especially teachers sharing their own mistakes with their students, the head sharing mistakes with his colleagues or subordinates.

When I hope my colleagues in middle school to share their own mistakes with their students, they usually hesitate for a while, then say that maybe college teachers can do this. And when I discuss the idea of sharing mistakes with college teachers, they may say that sharing mistakes should be useful to teachers in middle school. It's really interesting. I know it's very difficult, but I think that a real educationalist must have such a kind of spirit that other people have chances to learn from his mistakes. Whether sharing mistakes is the first standard of a real educationalist. In Chinese educationalist in the past three thousand years, I think, Confucius have such a kind spirit, sharing mistakes.

Two: Confucius' teaching idea: sharing his own mistakes with his students

Confucius (B. C. 551—479) is a great ideologist and educationalist in Chinese history, who was the pioneer creating the private schools which was the biggest. Before him, Knowledge had been controlled or dominated by the aristocrat; during his life, the trend was totally different, because the poor had an opportunity to learn knowledge. In Confucius' instruction, there is no separation into categories.^① In all his life, he devoted himself to education, except that he spent little time on politics as an official.

Based on the practice of building the private school, Confucius accumulated abundant teaching experiences and constructed his philosophy expressed through The Analects, compiled by his pupils. The educationalists after Confucius focused on the method of learning, then of teaching based on the method of learning, i.e. learning is the logic jumping-off place of teaching.

Confucius firstly expounds the proposition that a teacher is a learner. He said, "even when walking in the company of two other men, I am bound to be able to learn from them."^② And he don't like to be regarded as a Saint, "How dare I claim to be sage or a benevolent man?"^③ But he would be very happy if people called him a person eager to learn, because he realized that every one has the good quality to learn well. He said, "In a hamlet of ten households, there are bound to be those who are my equal in doing their best for others and in being trustworthy in what they say, but they are unlikely to be as eager to learn as I am."^④

So what's the character of a person eager to learn? Firstly, good at learning from others' virtues. Confucius said, "the good points of the one I copy; the bad points of the other I correct in

^①Confucius. The Analects[M], Published by the Penguin Group. 1979, p137.

^②Confucius. The Analects[M], Published by the Penguin Group. 1979, p88.

^③Confucius. The Analects[M], Published by the Penguin Group. 1979, p90.

^④Confucius. The Analects[M], Published by the Penguin Group. 1979, p80.

myself;^① Secondly, eager to ask problems or questions, especially, he was not ashamed to seek the advice of those who were beneath him in station^②; Thirdly learning accompanies all his life, which means long-life education. Confucius evaluated himself, “he is the sort of man who forgets to eat when he tries to solve a problem that **has been driving him to distraction(kept him from distraction)**, who is so full of joy that he forgets his worries and who does not notice the onset of old ages”.^③ And the last but most important character of a person eager to learn is living to the old, learning to the old, and making mistakes to the old. By the way, the character of making mistakes to the old is usually neglected by many educationalists in china.

In teaching methods, Confucius has a great contribution at least in three aspects summarized by the later educationalists. The first method is heuristic instruction, which requires the teacher to be good at stimulating students’ imagination and potential ability using good metaphor. For good metaphor of teachers, the student Yen Yuan had a deep impression, “The Master is good at leading one on step by step. He broadens me with culture and brings me back to essentials by means of the rites. I cannot give up even if I wanted to, but, having done all I can, it seems to rise sheer above me and I have no way of going after it, however much I may want to.”^④

The second is concerning teaching students according to their aptitude. But how can we know that the student has different aptitude? Up to now, the former educationalists hadn’t analyzed the reason in detail in China. In my point of view, the true answer is to identify a person’s aptitude or ability mainly according to his character of making mistakes, besides according to his correct answers. The master said, “in his errors a man is true to type..” In special situation, different people have a different mistake to the same problem. The teacher could analyze the students’ mistakes, and know their character, “Observe the errors and you will know the man”.^⑤

How to distinguish different ability? The method to Confucius is so simple, i.e. differentiate the person’s ability according to his character of making mistakes. So I think, it is right that the Japanese teachers analyze students’ mistakes in class, not similar to English teachers reluctant to talk student’s mistakes directly. But it’s not enough, because I haven’t gotten information that Japanese teachers have analyzed their own mistakes at the same time.

The third is concerning teacher’s making progress by learning from students who he teaches. It is easy to say that teachers should learning from their students, but in the process of teaching, it’s very difficult. Learning from students demonstrated Confucius’ old idea of democracy, which means that teacher cannot use his authority to refuse students’ good suggestion. Naturally the teacher should listen to students’ thinking if he wanted to learn from students. Modest Confucius often obtain enlightenment from students, such as he confessed Tzu-hsia’s help:“It is you, Shang, who have thrown light on the text for me. Only with a man like you can one discuss The Poem”.^⑥ Please attention, Confucius are more forty four years old than his student Tzu-hsia.

Indeed, it has been long for studying Confucius’ teaching thinking, and the three methods above are well known for all. But I think, the most important idea of sharing mistakes, especially teacher sharing their own mistakes with their students, has been neglected. If such a kind of spirit of sharing mistakes in our Chinese culture development could be inherited, I think, maybe we could gain another great step.

^①Confucius. The Analects[M], Published by the Penguin Group. 1979, P88.

^②Confucius. The Analects[M], Published by the Penguin Group. 1979, P78.

^③Confucius. The Analects[M], Published by the Penguin Group. 1979, P88.

^④Confucius. The Analects[M], Published by the Penguin Group. 1979, P97.

^⑤Confucius. The Analects[M], Published by the Penguin Group. 1979, P73.

^⑥Confucius. The Analects[M], Published by the Penguin Group. 1979, P68.

Here, the problem is why sharing mistakes have been neglected so long? Of course, this problem is very difficult to answer. The obvious answer is that the Chinese king trying to support his authority was reluctant to share his mistakes. So was the teachers, fathers, and the oldest. This paper considered roughly that Confucius' political ideas were inconsistent with his teaching idea. When Confucius wrote the book, Spring and Autumn Annals, he complied with the principal of hiding the mistakes of the Kings, the relatives and the talented. All the feudalism during 2,000 years mainly succeeded to Confucius' political ideas, and the teaching idea of sharing mistakes was totally pushed into the street corner of culture.

But when we study Confucius' idea, we have to be faced with one situation: the passage in The Analects is so short that many ideas expressed are not complete, and some ideas obtained from the Analects maybe don't belong to the original idea of Confucius. So all the ideas based on The Analects are composed of Confucius' and the learners'. It is impossible there exists pure research that reflects Confucius' true idea.

The following showed Confucius' idea of sharing mistakes in different circumstances. Here mistakes are confined to subject which teacher studies, not concerning private things.

(1) if the teacher don't tell his students about his mistakes, students would never know teacher's mistakes, which could enlighten student. Then how would the teacher deal with them?

Confucius have not suggested explicitly that we learn from our mistakes, but he put forward trying a certain way to learn and then found his mistakes through his thinking about trying, at last he comprehended something new. E.g. when Confucius talked about the relation of learning and thinking, he said, "If one learns from others but does not think, one will be bewildered. If, on the other hand, one thinks but does not learn from others, one will be in peril."^①

The question is how Confucius can conclude the aphorism. When Confucius educated his students, and he directly spoke out the aphorism to them, doesn't he just look like a Saint? But Confucius said, "I was not born with knowledge".^② He didn't hide his method, and told his students the way that, before he summarized his aphorism, he once spent all day thinking without taking food and all night thinking without going to bed, but he found that he gained nothing from it. It would have been better for him to have spent the time in learning.^③

The point of view, "If one learns from others but does not think, one will be bewildered. If, on the other hand, one thinks but does not learn from others, one will be in peril", was regarded as basic and important aphorism which Chinese teachers often use it to criticize or encourage students in learning. But when I knew about Confucius' "ridiculous" action, I really admired his intelligence that he could learn from his "ridiculous" action, and even made me surprise that he shared his "ridiculous" action with his students. As we know, Confucius told us everything obtained for him must be learned, and sometimes he had to make wrong.

The concision of The Analects gives us a large space to imagine, and at the same time, leave behind a lot of unsolved problems. Such as, Tseng Tzu said, "Every day I examine myself on three counts. In what I have undertaken on another's behalf, have I failed to do my best? In my dealings with my friends have I failed to be trustworthy in what I say? Have I passed on to others anything that I have not tried out myself? "^④

If you haven't undertaken on another's behalf, and failed to do your best? What will you do? If

^①Confucius. The Analects[M], Published by the Penguin Group. 1979, P65

^②Confucius. The Analects[M], Published by the Penguin Group. 1979, P88.

^③Confucius. The Analects[M], Published by the Penguin Group. 1979, P136.

^④Confucius. The Analects[M], Published by the Penguin Group. 1979, P59.

you have passed on to others anything that you have not tried out myself, and even worse, you have found something wrong, but the students didn't realized, what would you do? Of course, we could believe that Tseng Tzu would confess his mistakes, and analyze his mistakes with his students. But it's regretful that there no exist further records that described students' reaction in The Analects. What is called sharing mistakes , I want to express, just hidden in the Book.

(2) when the student vindicates his point of view and demonstrates what the teacher said is wrong in front of several students, how would the teacher deal with his them?

When Tzu-yu, one of Confucius' students, was the head of the city Wu Ch'eng, Confucius went to visit the city with many students. In the vicinity of the city, there Confucius heard the sound of stringed instruments and singing, and broke into a smile and said, "Surely you don't need to use an ox-knife to kill a chicken." What Confucius means that it's not necessary to administer such a kind of small city using a complicated system(Maybe what I understood are not correct in here). But Tzu-yu answered, "Some time ago I heard it from -you, Master, that the gentleman instructed in the Way loves his fellow men and that the small man instructed in the Way is easy to command." The master realized his mistakes and said to his followers, "my guys, come here, and listen! what Yen says is right." Confucius didn't want to hide his mistakes and shouted to his students to remind them, "My remark a moment ago was only -made in jest."

Here I felt that the master had a special spirit of sharing mistakes, but I haven't realized that for a long time.(I don't agree the translation of this passage in the book, The Analects, The Master said, "My friends, what Yen says is right. My remark a moment ago was only -made in jest."^①)

In the present, it's very difficult for our teachers that confess our mistakes overtly in class, when we answer a student's problem and the students find our mistakes. If we are not ready to declare our mistakes in the front of classroom, then the only student who knows our mistakes will "clever" enough to protect the other students from knowing them. I was a teacher in middle school many years ago, and I knew that I wasn't brave enough to confess my mistakes. In the circumstances, the first reaction is that we try to hide my mistakes. Now I hope I can overcome my shyness, and realize that sharing mistakes are more important than my authority.

(3) when another person points out your mistake that is difficult to correct, how would the teacher deal with it?

In the times of Confucius, it regarded as a basic moral law that men and women originating from the same clan couldn't marry. But Duke Chao broke the moral law. So Ch'en Ssu-pai asked whether Duke Chao was versed in the rites. Confucius said, "Yes."

After Confucius had gone, Ch'en Ssu-pai, bowing to Wu-ma Ch'i who was younger thirty three years than his teacher, invited him forward and said, "I have heard that the gentleman does not show partiality. Does he show it nevertheless? The Lord took as wife a daughter of Wu, who thus is of the same clan as himself, but he allows her to be called Wu Meng Tzu. If the Lord is versed in the rites, who isn't?" When Wu-ma Ch'i recounted this to him, the Master had no any excuse to justify himself, and said, "I am a fortunate man. Whenever I make a mistake, other people are sure to notice it."^②

Here Confucius had lots of choices to exculpate himself or keep silent, but he chose to confess his mistakes bravely in front of students. Some scholars evaluate this matter highly, in the light of this mistake so serious that the book, Spring and Autumn Annals, in the style of hiding mistakes of the Kings, the relatives and the talented, was the evidence to justify Confucius' mistakes. But when Wu-ma Ch'i recounted this to him, on one hand, Confucius was a normal man, and he couldn't

^①Confucius. The Analects[M], Published by the Penguin Group. 1979, P143.

^②Confucius. The Analects[M], Published by the Penguin Group. 1979, P90.

express his true idea to every occasion; on the other hand, he wouldn't like to become a small man, because "when the small man makes a mistake, he is sure to gloss over it".^①

According to the analysis above, there are mainly two ways of Confucius' mistakes to share: The first is that when students don't know them; the second is that when he found his mistakes with the help of a certain student, the teacher realizes that the mistake is so important and let more students know his. In the third, Confucius hadn't taken action like the second situation. But considering the third kind of mistake so serious, Confucius had no to take measures to hide his mistakes, at least he might ask his student not to tell other people. The most important is that his student recorded teacher's mistake and let us know that. So we can say, teacher and student cooperated to finish sharing mistakes.

We should know that Confucius is a normal person, in making mistakes, and his another great contribution often neglected is his idea of sharing mistakes demonstrating that Confucius is quite different from the normal man. Tzu-kung said, "The gentleman's errors are like an eclipse of the sun and moon in that when he errs the whole world sees him doing so and when he reforms the whole world looks up to him."^② So we can see, if you want to become a better teacher, you need to practise sharing mistakes in front of students gradually.

Three: Concrete Teaching Cases

The following will present two concrete teaching cases to expound the idea of sharing mistakes. The first case that I experienced during my career as a teacher in middle school is concerned with computing electric power of electromotor.

As we know, the electric power of an un-rotating electromotor is transformed into heat energy, and electric power $P=U \times I=I^2 \times R$, U is voltage of electromotor, I is electric current through it, and R is resistance; for Rotating electromotor, the electrical energy is converted into two part: one is heat power, and the other is mechanical energy. And Ohm's law doesn't work, which means $I \neq U/R$, and electric power $P=U \times I \neq I^2 \times R$.

When they try to solve electric problems, many students are inclined to forgetting the restrictive condition, which means that Ohm's law doesn't work, for Rotating electromotor. When I was a student, I often forgot the condition, and made several mistakes. So when I was a teacher, I directly told my students the correct answer., and the Experimental error is confined in 5%.

But teacher A still use $P=I^2 \times R$ to calculate electric power, when the motor is rotating. The experimental error was over 40%. And teacher A regarded that the reason why experimental error was so large was because the experimental machines wasn't precise.

A week later, teacher A discussed the experimental error with me, because students couldn't believe the experimental result that the experimental error was too large. I immediately pointed out the reason, and teacher A re-analyzed the data. Of course, he obtained the correct answer, and his student got a satisfied result.

But the story still had no end. One month later, in the examination of electric unit, students of teacher A solved the problems correctly about how to calculate electric power. But most of my students failed.

The result made me really frustrated. I taught my students the correct law, but they seemingly

^①Confucius. The Analects[M], Published by the Penguin Group. 1979, P154.

^②Confucius. The Analects[M], Published by the Penguin Group. 1979, P155.

refused to accept it. And teacher A made a big mistake, and later corrected them, but his students presented a perfect performance. Why? I reflected many times, until I studied Confucius' idea of sharing mistakes, and I felt I found the important reason. When I told my student the correct answer, I didn't tell the truth why I emphasized the condition of Ohm's law. If I would like to share my mistakes made during my student career with my students, what would happen? For teacher A practiced the idea of sharing mistakes with students non-intentionally in a certain extent.

In this case, there are many problems to solve. Such as the research of memory curve: for the same point of knowledge, what is the difference between sharing mistakes and non-sharing mistakes. And if a teacher teaches new students, how can he share his past mistakes which have been corrected.

The second teaching case is concerned with teacher sharing mistakes directly.

Here we want to introduce an old teacher, named Qin Renhe, who was ever a professor in Beijing University of Posts and Telecommunications. In 1962, Mr. Qin, twenty-three years old, was one of the youngest lecturers in China. At the beginning of the new semester, he finished his class of basic electrodynamics. He didn't feel satisfied, because he developed one concept, without full comprehension. Later he found what he understood was not correct. He hesitated to tell his students the truth, but at last he decided to correct it. In class, he said, "Last class, one point of knowledge what I expressed was not clear, and the concept was vague, so I have to rectify them now." Firstly he analyzed the content mentioned last class, and pointed out where the mistake existed. After finishing sharing how he made mistakes, he also shared the correct route.

When he drew conclusion at last, suddenly every student began to applaud heavily with splendid smiles, which made the young lecturer moved and excited. Forty three years later, Professor Qin was sixty six years old, and still has remembered that when he was young, he decided to confess his mistakes to his students bravely, shared them, and corrected them. The applauses have seen the scenery that a new young teacher in New China faced his students and himself sincerely.

It goes without saying that there are many cases of sharing mistakes in the process of teaching practices, but such a kind of practice still have no theory to support, and further research needs to perform.

In the above cases, there exist many problems. Indeed, we encourage teachers to share mistakes which are rational, not too simple or too low-leveled, then the first problem is how to define the standard of rational mistake; the second is whether sharing rational mistakes could stimulate students' interest, and make teacher and student to talk in equal ways; the third is how to support the teachers' authority, and how to define the authority, etc..

Four: concrete teaching suggestions in practising the idea of sharing mistakes

Through studying the idea of Confucius' thinking, we can say, sharing mistakes just went back to the Confucius' true life. At this point, sharing mistakes is a kind of old idea, and we need to inherit it in modern society. The idea requires us to respect the "right" of the teachers to make mistakes in class, and realize the mistakes can enlighten students.

Then, how can we practise the "new" idea in living teaching process? Four aspects mainly:

(1) Cultivating the desire to share rational mistakes. To attain this end, we need to tolerate others' mistakes. In class, how can the atmosphere of forgiving mistakes come into being? The most important factor is whether the teacher share his own mistakes, guides them to learn from his

mistakes.

(2) Storing new teaching resources. It is a very valuable mistake when teacher make it in preparing for class. He should record and store them in time, because some valuable mistakes would disappear if we cannot catch them immediately.

(3) Building new system of evaluation. In our present system of evaluation, if a certain teacher made a mistake, and at that time, if the leaders of the school listen to his class, the teacher's reputation would be harmed seriously. We seldom ask such a kind of question: how to make the mistakes bring out the most valuable result? How to make every mistake to become a chance? So here we propose that when we evaluate teachers' class good or bad, we need to add to another form, i.e. a teachers who participates evaluation of class should begin from one of his mistakes, then guides students to explore a new field and excites their thinking based on the teacher' mistake.

(4) Adding new teaching words. All of good ideas, I think, should affect teachers' words used in class. We need add to another words: "Today, we began our class from teacher' mistakes or my mistakes." If the teacher have class in such a kind of sentence, he must trust himself. So we suggest that a teacher who has obtained good reputation often use such a sentence. Considering teaching schedule, maybe teacher should systemize his mistakes to let students catch them easily.

Although all the above emphasize that teachers share their own mistakes with students, in fact, among teachers, students, and between teachers and students, it is necessary to share rational mistakes.